Painless Statistics for Compliance Professionals

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Auditing and Investigations Overview
Elements of a Compliance Program:

- Board Commitment/Oversight
- Standards of Conduct/Written Policies and Procedures
- Guidance and Reporting System
- Education and Training
- Investigation/Corrective Action
- Auditing and Monitoring
  - Find and fix Problems
  - Disclose/refund to the government
  - Risk management model
- Enforcement/Discipline

Internal Compliance Investigations:

- Joint effort by the Compliance Counsel and Compliance Officer
- Gather information relevant to the perceived problem
- Review documents and interview witnesses
- Deliver compliance advice based on conclusions from the internal investigation
- If sufficiently thorough and probing, enforcement agencies may be more inclined to accept results with a reduced level of agency inquiry.
Investigation Guidance

1. Knowing When to Perform
2. Goals of Review
3. Conducting the Investigation
   a. Notifications
   b. Obtaining Facts
   c. Identifying potential cause(s) and impact(s)
   d. Establishing a defense strategy
   e. Reviewing substantive law and applicability of waivers

Goals of Review:

- Develop an understanding of potential allegations of noncompliance
- Discover relevant facts
- Determine billing errors and Medicare/Medicaid overpayments
- Avoid potential whistleblower action/government investigation
Conducting the Investigation

IDENTIFYING POTENTIAL CAUSE(S) AND IMPACT(S):

- Potential causes of incident
- Impact on health, safety and/or quality of care
- Detailed description of incident, including:
  - Time period in question
  - Estimate of the magnitude of the issue
  - Individuals involved
  - Files/materials reviewed
  - Individuals who should have detected non-compliance

Disclosure – To Whom?

- Many factors to be considered
- Variety of choices
  - Fiscal intermediaries or carriers
  - Centers for Medicare and Medicaid Services (CMS)
  - Office of Inspector General (OIG)
  - A local U.S. Attorney’s office (DOJ)
  - States Attorneys General
Purpose of Sampling

- The Medicare Prescription Drug, Improvement, and Modernization Act of 2003 mandates that before using extrapolation to determine overpayment amounts, there must be a determination of sustained or high level of payment error.
- The purpose of sampling is to use a portion of the population of interest to generalize back, or infer to, the population of interest.
Determining a High Level of Error

- A variety of means, including, but not limited to:
  - Error rate determinations by governmental units
  - Probe samples
  - Data analysis
  - Provider/supplier history
  - Information from law enforcement investigations
  - Allegations of wrongdoing
  - Audit or evaluations conducted by the OIG

Major Steps in Statistical Sampling

- **Select** the provider or supplier
- **Select** the period to be reviewed
- **Define** the sampling **universe**, the sampling **unit**, and the sampling **frame**
- **Design** the sampling plan and select the sample
- **Review** each of the sampling units and determine any overpayments or underpayments
- **Estimate** the overpayment
Why Sample?

- To find the unknown characteristics of interest of the population
- Save time
- Save money

Period of Review

Determined by:

- How long the pattern of sustained or high level of payment error existed
- The volume of claims involved
- The length of time that the national coverage decision or regional/local coverage policy has been in effect
- The extent of prepayment review already conducted
- The dollar value of the claims relative to the cost effectiveness of a sample
- The applicable period for reopening claims
Types of Samples

- **Probability samples:**
  - The probability of selecting any one element from the population is known and equal.

- **Non probability samples:**
  - The probability of selecting any one element from the population is *not known* and *not equal*.

Types of Probability Samples

- Simple random sampling
- Systematic sampling
- Stratified sampling
- Cluster Sampling

*These methods should yield samples that have characteristics that are very close to those of the population.*
Simple Random Sampling

Each member of the population has an equal and independent chance of being selected.

- Steps to follow:
  - Define the population of interest
  - List all members of the population
  - Randomly select members from the population using some type of random process, e.g., computer program

Simple Random Sampling Considerations

Use this method when the population members are similar to one another.

- Advantage:
  - Ensures a high degree of representativeness

- Disadvantage:
  - Time consuming and tedious
Systematic Sampling

This method requires every $n^{th}$ item be selected.

- Steps to follow:
  - Make sure the population is not sorted in any way
  - Divide the population size by the desired sample size
  - Choose a starting point at random
  - Select every $n^{th}$ item from the starting point

Systematic Sampling Considerations

Use when the population members are similar to each other.

- Advantage:
  - Ensures a high degree of representativeness

- Disadvantage:
  - Less random than simple random sampling because once the starting point is determined, each member does not have the same chance of being selected.
Stratified Sampling

Used to assure that the strata in a population are fairly represented in the sample.

- Especially important when the distinguishing factors (strata) are related to what is being studied
- **Steps to follow:**
  - Members of each strata are listed separately
  - A random sample from each strata is selected

Stratified Sampling Considerations

Used when the population is heterogeneous and contains different groups, some of which are related to the topic of the study.

- **Advantages:**
  - Ensures a high degree of representativeness of all of the strata or layers in the population
- **Disadvantage:**
  - Time consuming and tedious
Cluster Sampling

Used when units of individuals are selected rather than the individuals themselves.

- **Steps to follow:**
  - Identify the units of interest
  - Randomly select a sample of the units
  - Examine each element within each selected unit

Cluster Sampling Considerations

Use when the population consists of units rather than individuals.

- **Advantage:**
  - Easy and convenient

- **Disadvantage:**
  - Members of units may be too different from each other
Sample Validation

- Our samples are validated by making sure that a characteristic of the sample (e.g., average payment per patient) is within a certain number of standard deviations of the population mean.
  - Our methodology uses 1.96 standard deviations
- The validation demonstrates that the sample is a good representation of the population from which it was drawn.

Sampling Problems

- Sampling Error
- Bias Sampling
Sampling Error

- Lack of fit between the sample and the population
- The difference between the characteristics of the sample and the population from which the sample was selected is a natural occurrence
- The larger the sampling error, the less the sample results can be generalized to the population

Minimizing Sampling Error

- Increase the sample size as much as possible and reasonable
- Use probability sampling methods rather than non-probability sampling methods
- At the extreme, conduct a census rather than perform sampling
Biased Sample

A biased sample is one in which the method used to create the sample results in a sample that is systematically different from the population.

- Any generalization about the population made with a biased sample will not be valid.
- The solution is to use a randomly selected sample.

Sample Size Considerations

- Confidence desired
- Level of variability in the population
- Precision level
- Also know as effect size
Confidence Level & Precision

- Example:
  - Confidence Level = 95%
  - Precision = 7%
  - Sample Mean = $50

- Interpretation:
  - We can be 95% confident that the population mean will be between $46.50 and $53.50 ($50 ± 7%)

When Will a Larger Sample Size be Needed?

As elements become more diverse, a larger sample size will be needed to represent all of them.

- A larger sample size will also be needed when:
  - The amount of variability within groups is greater
  - The difference between groups gets smaller

  • As the difference between groups gets smaller, a larger sample will be needed to reach the “critical mass” where the groups can differ.
Final Sampling Issues

- Record (patient) substitution
- Projection of sample findings to the population

Record Substitution

Once a sample is selected, records (patients) can not be substituted.

- Doing so invalidates the original sample and precludes the projection of findings back to the population.
Projection of sample findings

Since a valid random sample is a representation or a “mirror image” of the population, it is defensible to project sample findings onto the population from which the sample was drawn.

- This projection can include any characteristic of the sample.

Types of Non Probability Samples

- Convenience sampling
- Quota sampling

*These methods will probably yield samples with characteristics that are not close to those of the population.*
Convenience Sampling

Used when the units of interest are “captive”.

- Steps to follow:
  - Select the “captive” population
  - Select the sample

Convenience Sampling Considerations

Used when the members of the population are convenient to sample.

- Advantage:
  - Convenient and inexpensive

- Disadvantage:
  - Results can not be generalized to the population
Quota Sampling

Used when a stratified sample is desired, yet proportional stratification is not possible.

- **Steps to follow:**
  - Decide on strata definitions
  - Choose individuals in each strata until quota is reached

Quota Sampling Considerations

Use when strata are present and stratified sampling is not possible.

- Advantage:
  - Insures some degree of representativeness of all the strata in the population

- Disadvantage:
  - Results can not be generalized to the population
Statistical Tools

Tools to determine sample size:

- RAT-STATS
  - Assists the user in selecting random samples and estimating improper payments
- SPSS
  - Data preparation, data management, output management, and charting features
- Excel
  - Provide email address, we will send you a copy

Questions? Comments?

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